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ABSTRACT

Intended for use by all trowel trade instructors in the Metropolitan Nashville Public Schools, this guide provides a sequential listing of course content and scope. A course description provides a brief overview of the content of the courses offered in the trowel trades (masonry) program. General course objectives are then listed. Outlines of the course content are presented for these courses: trowel trades (masonry) I, II, and III. Suggested time and specific objectives are provided for each major topic. A listing of resource materials, which includes textbooks, curriculum guides, and audio visual materials, is appended. (YLB)

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TROWEL TRADES

SCOPE AND SEQUENCE

VOCATIONAL EDUCATION

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Metropolitan Public Schools

Nashville Davidson County, Tennessee

Charles O. Frazier, Director

FOREWORD

This scope and sequence guide, developed for the Trowel Trades Vocational Education program, represents an initial step in the development of a systemwide articulated curriculum sequence for all vocational programs within the Metropolitan Nashville Public School System. It is a direct result of needs expressed by teachers, parents, and the business community for sequential structure within the vocational education curriculum. An articulated vocational curriculum allows a student to move from one level of instruction to the next without repeating learning tasks already mastered, and without experiencing gaps in the presentation of relevant instructional material.

A goal of this curriculum effort is to provide teachers a usable guide based on input from the teachers. The initial step was an identification of course content, with all teachers having an opportunity to contribute. What follows is a publication using the teachers' contributions: a sequential listing of objectives and skills for each program offering.

This guide does not include all specific resource materials that may be used to assist students in acquiring minimum competencies. It is to serve as a guide for the sequence of course content and scope of what is to be taught. This guide content is extremely important and its use is encouraged. The suggested competencies and resource materials allow instructors an opportunity to be creative and resourceful in meeting the needs of individual programs and students.

ACKNOWLEDGEMENT

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INTRODUCTION

This guide is designed to be used by all trowel trade teachers in the Metropolitan Nashville Public Schools.

It is suggested that any variation or rearrangement be confined to the semester in which it is listed, except for safety and Vocational Industrial Clubs of America (VICA) being applicable to each level and semester.

COURSE DESCRIPTION

Trowel Trades I (Masonry) is recommended for 10th grade students who are interested in the many fields that masonry work can offer. Students will learn the safe use of hand and power tools needed in the masonry construction field. They will learn how to use a transit with corresponding blueprints involving many phases of mathematics.

Trowel Trades II (Masonry) is recommended for students who have successfully completed Trowel Trades I (Masonry) and have exemplified interest, enthusiasm and progress in knowledge and skill development in the trade. Students will learn to compute the amount of materials and cost for a job or project. They will learn how to lay out a foundation, square a house and locate offsets with the use of house plans and tools. Students will also have some on-the-job training outside the school by working on small projects.

Trowel Trades III (Masonry) is recommended for students who have successfully completed Trowel Trades II (Masonry) and have indicated that they have chosen masonry as a career. Students will engage in the experiences of a skilled craftsperson in masonry. They will be employed as class leaders, estimate jobs and work up the necessary materials to complete the jobs. Students who successfully complete this course should be eligible for employment in the masonry industry as a semiskilled craftsperson or self-employment in the trade.

GENERAL COURSE OBJECTIVES

1. To orient students to the construction industry and to the benefits and advantages that are available to persons in the masonry fields
2. To teach the proper care and/or use of basic tools, materials and equipment in all forms of masonry work
3. To teach safety procedures in the field of masonry occupations
4. To teach the students how to read drawings, blueprint and technical materials
5. To teach students to demonstrate acceptable workmanship
6. To teach students how to lay block, brick and to pour concrete
7. To encourage leadership training through participation in VICA activities
8. To help students develop leadership abilities by allowing students to assume the responsibility of job leader
9. To stress the importance of working cooperatively with other persons engaged in the same project
10. To teach students to keep abreast of current trends, techniques and prectices in the masonry field
11. To acquaint students with local building codes and standards
12. To help students become aware of local sources of building materials and employers in the masonry field
13. To encourage students to become productive persons in society

COURSE CONTENT FOR TROWEL TRADES I (MASONRY)

(First Semester)

I. **Introduction to basic masonry (2 weeks)**

Specific objectives:

To learn class procedures and expectations
To participate in VICA
To learn safety procedures

A. Becomes oriented to course requirements

B. Learns general shop safety rules

C. Learns housekeeping procedures

D. Participates in Vocational Industrial Clubs of America

1. Purpose

2. Pledge, motto and goals

II. **Mathematics for masonry (3 weeks)**

Specific objectives:

To understand the importance of knowing math in the masonry field
To solve problems related to the masonry trade

A. Understands basic fundamentals

B. Knows fractions and decimals

C. Uses folding rules and steel tapes

D. Makes measurements on blueprints

E. Understands transit principles

III. **Blueprint reading and sketching (3 weeks)**

Specific objectives:

To understand simple blueprint lines and symbols

Specific objectives continued:

To interpret information necessary for planning construction
To learn how to sketch ideas; how to interpret sketching

A. Reads a set of house plans

B. Measures from blueprints

C. Recognizes the masonry information on blueprint

D. Sketches masonry symbols and projects

IV. **Selection and preparation of building sites (8 weeks)**

Specific objectives:

To understand some of the local codes
To use tools and equipment properly
To learn how to layout a house and square the corners
To learn how to get the foundation level

A. Understands local codes and restrictions

B. Identifies and uses hand tools

C. Identifies and uses power tools

D. Learns to plot a house

1. Stake location

2. Square the house

3. Set stakes for batter boards

4. Set elevation lines with transit

5. Set batter boards

6. String lines on batter boards

7. Lime footing lines

V. **Identifying and obtaining materials (2 weeks)**

Specific objectives:

Specific objectives continued:

To identify different grades or types of concrete
To make out an adequate bill of materials for the footing

A. Identifies types and grades of concrete

   1. Footings

   2. Sidewalks

   3. Patios

   4. Exposed aggregate

B. Determines the amount and type concrete for a footing

C. Prepares a bill of materials

COURSE CONTENT FOR TROWEL TRADES I (MASONRY)

(Second Semester)

I. **Introduction to block, brick and mortar (9 weeks)**

Specific objectives:

To identify the different shapes and sizes of block
To identify the different shapes and sizes of brick
To become familiar with the manufacturing processes of bricks and blocks
To understand how mortar is manufactured
To become familiar with the many mixtures and uses of mortar

A. Learns manufacturing processes and the types of block

1. Stretchers
2. Corners
3. Double corners of pier
4. Solids
5. Aggregates and admixtures
6. Surface texture
7. Decorative blocks
8. Screen block

B. Learns manufacturing processes and the types of brick

1. Clay masonry materials
2. Standard, engineer, economy, Roman, "SCR" brick, jumbo
3. Stretcher, header, sailor, soldier, rowlock, rowlock stretcher and shiners
4. Solids and core

C. Learns manufacturing processes and types of mortar

C. Learns manufacturing processes and types of mortar continued:

1. Mortar materials
2. Sand mixtures
3. Mortar properties
4. Mortar types
5. Color
6. Weather

II. **Laying masonry units (9 weeks)**

Specific objectives:

To learn to safely use tools and equipment
To develop skills with the trowel
To understand the shape of block and brick
To understand how bricks and block are made and how they are used

A. Works the mortar

1. Mixing by hand
2. Mixing by machine
3. Working on board
4. Spreading
5. Loading trowel
6. Mortar consistency

B. Lays the brick

1. Common bond wall with leads
2. Building corners
3. Laying brick to the line
4. Striking joints
5. Remove extra mortar with trowel

B. Lays the brick continued:

6. Brush and clean the wall

C. Lays concrete block

1. Mortar mixture
2. Full mortar bed spread
3. Laying corner block
4. Laying stretchers
5. Building corners
6. Laying block to line
7. Striking joints
8. Removing extra mortar with trowel
9. Brushing the wall
10. Cleaning

COURSE CONTENT FOR TROWEL TRADES II (MASONRY)

(First Semester)

I. **A review of Trowel Trades I (Masonry) (6 weeks)**

Specific objectives:

To become familiar with class procedures and expectations
To reinforce knowledge and understanding acquired during Trowel Trades I (Masonry)

A. Reviews course requirements and safety rules

B. Participates in VICA organization activities

C. Understands mathematics used in Trowel Trades

D. Reads and sketches blueprints

E. Determines selection and preparation of building site

F. Uses transit and levels

G. Makes concrete footings

H. Block, brick and mortar

II. **Concrete (6 weeks)**

Specific objectives:

To learn to use safely concrete tools and equipment
To develop skills and knowledge of concrete pouring and finishing
To obtain practical skill in concrete form construction

A. Manufactures cement

B. Mixes concrete

1. Materials

2. Methods

C. Prepares ground on which concrete is poured

II. **Concrete continued:**

D. Reinforces concrete

E. Builds forms for concrete for construction

1. Sizing materials (for different thickness)
2. Staking forms
3. Curved forms
4. Steel form materials
5. Prefabricated forms
6. Footing forms
7. Form techniques for steps
8. Arch forms

F. Develops concrete pouring skills

G. Learns screeding procedures

H. Uses floats and bullfloats

I. Learns edging and jointing operations

J. Learns troweling procedures

K. Learns brooming procedures

L. Learns exposed aggregate operations

III. **Block and brick skills (6 weeks)**

Specific objectives:

To learn more about trowel use on block and brick
To understand the different ways block and brick can be used

A. Uses running bond pattern with block

B. Develops skills on stack bond pattern

C. Designs pilasters, columns and piers

III. **Block and brick skills continued:**

D. Builds brick wall to correct height

E. Builds brick piers and columns

F. Uses capping with solid brick

COURSE CONTENT FOR TROWEL TRADES II (MASONRY)

(Second Semester)

I. **Concrete work with projects (6 weeks)**

Specific objectives:

To reinforce knowledge and understanding of the construction trades
To develop skill in the practical use of tools, materials and equipment

A. Makes field trips to contruction sites

B. Builds forms from a desired plan

C. Pours projects

D. Constructs benches, flower planters

II. **Brick projects (6 weeks)**

Specific objectives:

To develop skills in the practical use of tools, materials and equipment
To gain practical knowledge and skills by participating in live projects

A. Makes field trips to construction sites

B. Constructs benches and flower planters

C. Builds columns

1. Driveway columns

2. Porch columns

3. Fence post columns

4. Bench columns

III. **Block projects (6 weeks)**

Specific objectives:

To develop knowledge and skill in the practical use of tools, materials and equipment

Specific objectives continued:

To understand the appropriate procedures for performing a job

A. Builds foundations

B. Builds retaining walls

1. Driveway retainer

2. Yards retainer

COURSE CONTENT FOR TROWEL TRADES III (MASONRY)

(First Semester)

I. **A review of Trowel Trades II (Masonry) (9 weeks)**

Specific objectives:

To become familiar with class procedures and expectations
To refresh knowledge and understanding acquired during Trowel Trades II (Masonry)

A. Understands VICA organization concepts

B. Reviews safety rules

C. Reviews mathematics

D. Reads and sketches blueprints

E. Selects and prepares site

F. Uses transit and levels

G. Reviews concrete construction

H. Reviews brick and block construction

I. Knows current trends and practices

J. Knows current code requirements

K. Understands employment opportunities

II. **Building with stone (9 weeks)**

Specific objectives:

To become familiar with the knowledge and skill of laying stone
To obtain practical skills with the proper tools and equipment

A. Understands selecting and shaping stone

B. Demonstrates splitting stone

C. Demonstrates squaring

II. **Building with stone continued:**

D. Demonstrates breaking across a stone's grain

E. Demonstrates chipping into a curve

F. Demonstrates building stone walls

G. Builds veneer walls

H. Knows stone balancing

I. Uses stone shimming and shoring techniques

J. Prepares dry bonding

K. Using mortar mixtures

L. Demonstrates cleaning techniques

COURSE CONTENT FOR TROWEL TRADES III (MASONRY)

(Second Semester)

I. **Projects for developing competency in practical skills (18 weeks)**

Specific objectives:

To reinforce knowledge and understanding of the construction trade
To develop skill in the practical use of tools, materials and equipment
To be accurate, honest and efficient in performance

A. Utilizes on-sight projects or actual jobs for skill development

B. Makes field trips to construction sites

C. Visits employers and employment agencies

D. Becomes acquainted with related fields

RESOURCE MATERIALS

Textbooks

DeCristoforo, R. J. Concrete and Masonry Techniques and Design. Virginia: Reston Publishing Company, Inc., 1975.

Kicklighter, Clois E. Modern Masonry. The Goodheart-Wilcox Co., Inc., 1980.

Roark, William F. and Harry C. Plummer. Bricklaying Vocational Training. Brick Institute of America, McLean, Virginia, 1975.

Curriculum Guides

Masonry V-Tecs, Wayne Teague, State Superintendent of Education, T. L. Faulkner, Director, Division of Vocational Education, Montgomery, Alabama, 1978.

Audio Visual

Kits: filmstrip & tapes

"Brick A Pattern for Living", Kodak
"Corner Poles", Kodak
"How to construct an Energy-efficient Fireplace", Kodak
"Laying out a Foundation", Kodak
"The Making of Brick", Kodak
"Masonry Elementary of Brickwork", Moreland Latchford Sound Filmstrip
"Walls and Bonds", Moreland Latchford Sound Filmstrip

Films

"The Foundation", Metropolitan Nashville Public Schools Materials Center

"The Wood Shell", Metropolitan Nashville Public Schools Materials Center